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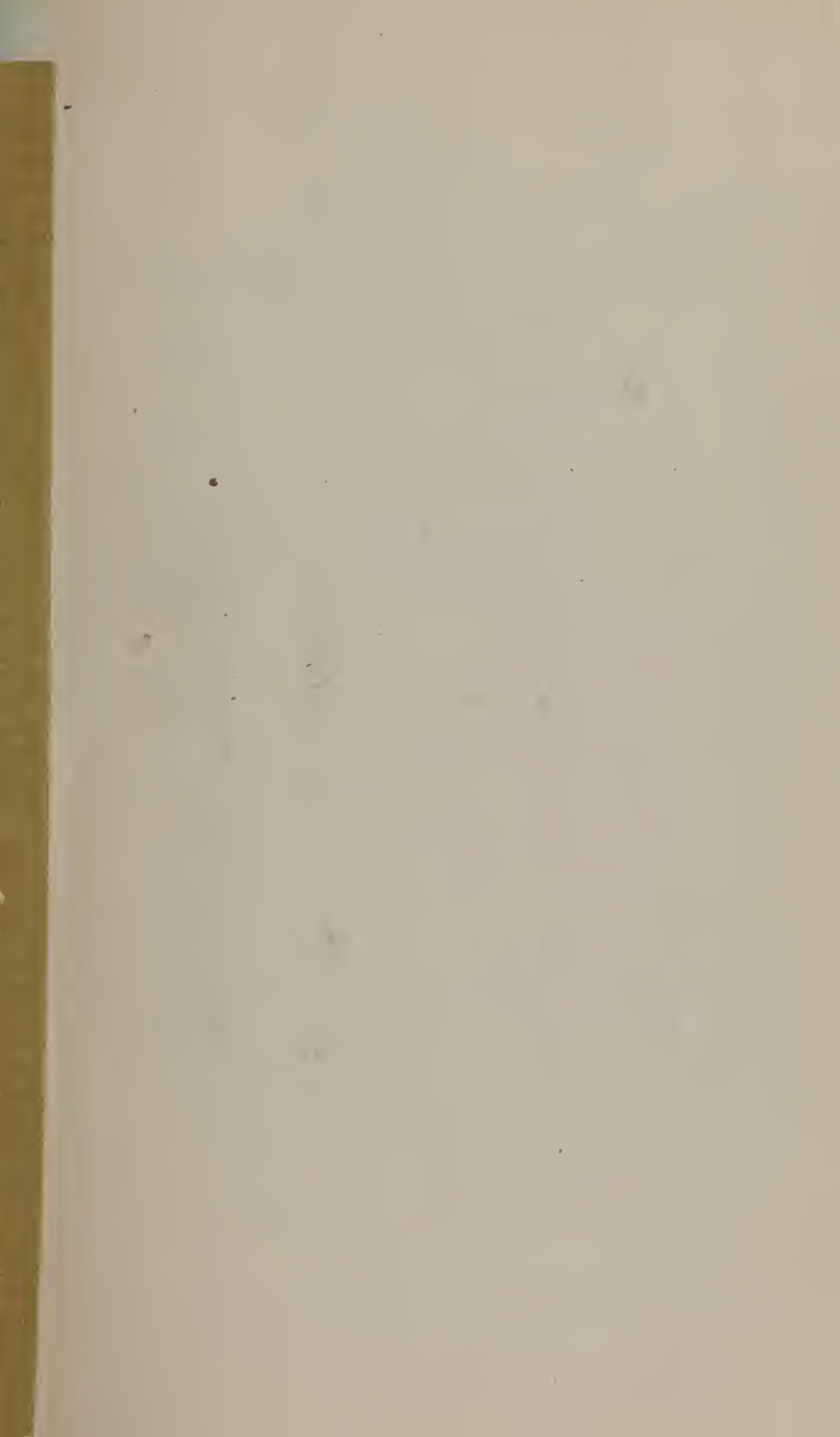
Spinal Irritation

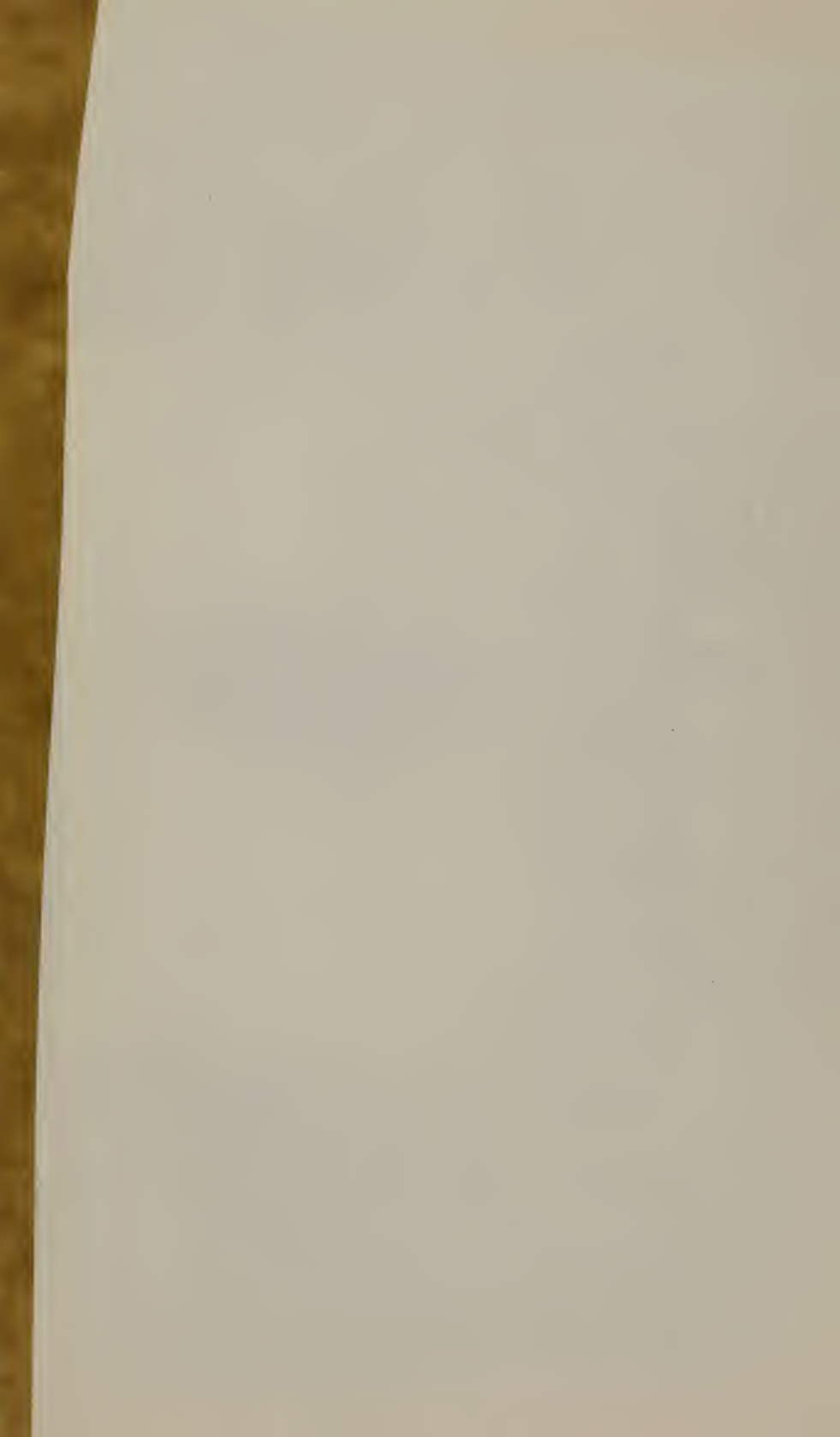
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SPINAL IRRITATION.

BY

WILLIAM A. HAMMOND, M.D.,

PROFESSOR OF DISEASES OF THE MIND AND NERVOUS SYSTEM AND OF CLINICAL MEDICINE
IN THE BELLEVUE HOSPITAL MEDICAL COLLEGE, PHYSICIAN-IN-CHIEF TO THE NEW
YORK STATE HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM, ETC.

[Read before the New York County Medical Society, January 17, 1870.]

[FROM THE JOURNAL OF PSYCHOLOGICAL MEDICINE, APRIL, 1870.]

NEW YORK:
D. APPLETON AND COMPANY,
90, 92 & 94 GRAND STREET.
1870.

Elliot's Obstetric Clinic.

A Practical Contribution to the Study of Obstetrics and the Diseases of Women and Children. By GEORGE T. ELLIOT, Jr., A. M., M. D., Prof. of Obstetrics and the Diseases of Women and Children in the Bellevue Hospital Medical College, Physician to Bellevue Hospital and to the New York Lying-in Hospital, etc., etc. 8vo, pp. 458. . . . Cloth, \$4.50

This volume, by Dr. Elliot, is based upon a large experience, including fourteen years of service in the lying-in department of Bellevue Hospital of this city. The book has attracted marked attention, and has elicited from the medical press, both of this country and Europe, the most flattering commendations. It is justly believed that the work is one of the most valuable contributions to obstetric literature that has appeared for many years, and, being eminently practical in its character, cannot fail to be of great service to obstetricians.

"The volume by Dr. Elliot has scarcely less value, although in a different direction, than that of the Edinburgh physician (Dr. Duncan, *Researches in Obstetrics*). The materials comprising it have been principally gathered through a service of fourteen years in the Bellevue Hospital, New York, during the whole of which time the author has been engaged in clinical teaching. The cases now collected into a handsome volume illustrate faithfully the anxieties and disappointments, as well as the fatigues and successes, which are inseparable from the responsible practice of obstetrics—a line of practice which, under difficulties, demands the greatest moral courage, the highest skill, and the power of acting promptly on a sudden emergency. Dr. Elliot's favorite subject appears to be operative midwifery; but the chapters on the relations of albuminuria to pregnancy, ante-partum hæmorrhage, the induction of labor, and the dangers which arise from compression of the funis, are all deserving of careful perusal. The pleasure we feel at being able to speak so favorably of Dr. Elliot's volume is enhanced by the circumstance that he was a pupil at the Dublin Lying-in Hospital when Dr. Shekelton was master. We can certainly say that his teachings reflect great credit upon his Alma Mater."—*London Lancet*, April 11, 1863.

"This may be said to belong to a class of books 'after the practitioner's own heart.' In them he finds a wider range of cases than comes under his observation in ordinary practice; in them he learns the application of the most recent improvements of his art; in them he finds the counterpart of cases which have caused him the deepest anxiety; in them, too, he may find consolation, for the regret—the offspring of limited experience, which has always cast a shadow on the remembrance of some of his fatal cases—will pass away as he reads of similar ones in which far greater resources of every kind failed to avert a fatal termination.

"There are not many books of this kind in our language; they can probably all be numbered on the fingers of a single hand. * * * Many circumstances concur, therefore, to influence us to extend to this work a cheerful welcome, and to commend it as fully as possible. We do thus welcome it: as the production of a gentleman of great experience, acknowledged ability, and high position—as an emanation from one of the leading schools of our country, and as an honorable addition to our national medical literature."—*American Journal of Medical Science*, April, 1863.

"As the book now stands, it is invaluable for the practitioner of obstetrics, for he will hardly ever in practice find himself in a tight place, the counterpart of which he will not find in Dr. Elliot's book."—*New York Medical Journal*, February, 1863.

"The book has the freshness of hospital practice throughout, in reference to diagnosis, pathology, therapeutical and operative proceedings. It will be found to possess a great amount of valuable information in the department of obstetrics, in an attractive and easy style, according to the most modern and improved views of the profession."—*Cincinnati Lancet and Observer*, April, 1863.

"As a whole, we know of no similar work which has issued from the American press, which can be compared with it. It ought to be in the hands of every practitioner of midwifery in the country."—*Boston Medical and Surgical Journal*.

"One of the most attractive as well as forcibly instructive works we have had the pleasure of reading. In conclusion, we recommend it as one having no equal in the English language, as regards clinical instruction in obstetrics."—*Am. Jour. of Obstetrics*, Aug., 1863.

Many ripe, elderly practitioners might, but few young could, write a book so distinguished by candor, want of prejudice, kindly feeling, soundness of judgment, and extent of erudition. While we do not say the book is faultless, we say there is no book in American obstetrical literature that surpasses this one. * * * The work now under review is his first-born book or volume, and shows how fine opportunities he has had, chiefly at Bellevue Hospital, for acquiring experience, and how diligently he has availed himself of them. But his book shows much more. It is the work of a physician of high education, a qualification in which obstetric authors are often deficient—it shows qualities of mind and skill of hand rarely attained by so young a man."—*Edinburgh Medical Journal*, Feb., 1863.

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SPINAL IRRITATION.

HISTORY.

It has been questioned by several distinguished authors whether such an affection as spinal irritation really exists as a distinct disease. Thus Valleix¹ ascribes the most important of its manifestations to hysteria, and regards the spinal tenderness present as being due to simple intercostal neuralgia; Inman² considers the pain produced by pressure over the spinous processes of the vertebræ as existing in the muscular attachments, and as indicative of what he calls myalgia. Mr. Skey³ evidently looks upon all cases of spinal irritation as hysterical in their character, and Niemeyer⁴ speaks incredulously on the subject, without giving

¹ *Traité des névralgies ou affections douloureuses des nerfs.* Paris, 1841, p. 345.

² *On Myalgia: its Nature, Causes, and Treatment, etc.* Second edition, London, 1860, p. 225, *et seq.*

³ *Hysteria, etc.,* New York, 1867, p. 72, *et seq.*

⁴ *A Text-Book of Practical Medicine.* American edition, New York, 1869, vol. ii., p. 258.

any very decided opinion. It would be easy to bring forward other authorities who have expressed similar views, and I may have to allude to some of them more fully hereafter.

My own opinion is, that there is a well-defined disease of the spinal cord, which, if designated by its pathology, may properly be called spinal irritation, but which, in a system of nomenclature based upon morbid anatomy, would preferably be named spinal anæmia. In the recently-published nomenclature of the Royal College of Physicians,¹ the affection has no place unless it be included under the head of hysteria.

The first author who distinctly grouped together the symptoms of spinal irritation was J. Frank,² who, under the name of rachialgia, described the disorder with considerable accuracy, and laid the principal stress upon the local pain. He was followed by Stiebel,³ who, however, contributed little to our knowledge of the subject.

Mr. J. R. Player⁴ was among the first English physicians, if not the very first, to call attention to the fact that eccentric derangement of function may be the result of irritation of the spinal cord. Thus he says: "Most medical practitioners who have attended to the subject of spinal disease must have observed that its symptoms frequently resemble various and dissimilar maladies, and that commonly the function of every organ is impaired whose nerves originate near

¹ The Nomenclature of Diseases drawn up by a Joint Committee appointed by the Royal College of Physicians of London. London, 1869.

² De Rachialgitide in Prax. Med. Univ., P. II., t. i., p. 37.

³ Über Neuralgia Rachitica, Rust's Magazine, t. i., c. xvi., p. 549.

⁴ Quarterly Journal of Science, vol. xii., p. 428. Quoted by Teale.

the seat of disorder. The occurrence of pain in *distant parts* forcibly attracted my attention, and induced frequent examination of the spinal column; and, after some years' attention, I considered myself enabled to state that, in a great number of diseases, morbid symptoms may be discovered about the origins of the nerves which proceed to the affected parts, or of those spinal branches which unite them; and that, if the spine be examined, more or less pain will commonly be felt by the patient on the application of pressure about or between those vertebræ from which such nerves emerge."

The term "spinal irritation" appears to have been first used by Dr. C. Brown,¹ of Glasgow, who, in a very excellent paper, gives a picture of the disorder which cannot fail to be recognized as truthful and exact by those who have witnessed several cases of the affection. He insists upon not confounding the complaint with those organic diseases of the vertebræ and spinal cord which some of its symptoms cause it to resemble, points out the variation of the phenomena according to the seat of the spinal tenderness, and inculcates the employment of rest and counter-irritation as the most effectual remedies. His ideas of the pathology of the disease are: "That the immediate cause of the pain of the back and breast is spasm of one or other of the muscles arranged along the spine altering the position of the vertebræ, or otherwise compressing them as they issue from the spinal marrow.

"That this spasm in many instances is strictly a *local* disease, produced by fatigue, wrong posture, or

¹ On Irritation of the Spinal Nerves. Glasgow Medical Journal, No. II., May, 1828.

other causes, and quite unconnected with the state of the brain, spinal marrow, or nervous system in general.

“But that, in other formidable instances, this partial, spasmodic, or wrong action of the muscles is owing to a faulty state, perhaps an enlargement, of the vessels of the brain or spinal marrow. This state of the brain, as in many other diseases, gives rise to spasm or even to convulsion of certain muscles; which partial symptom from its severity attracts the chief attention. This local affection is confined to those portions of the spine where there is the greatest motion, and where, of course, the muscles having the greatest activity are most liable to deranged action or spasm. I imagine that this view of the subject is illustrated and perhaps confirmed by various symptoms which were observed in the different cases, and which without it were very incomprehensible. The partial palsy, the affection of the sight, the giddiness of the head (for I find that this was a prominent symptom in several cases, especially in that of A. S.), all give some confirmation to the notion that the brain is affected in these severe cases.”

Dr. Darwall,¹ of Birmingham, describes several features of the affection with accuracy, such as those simulating cardiac and gastric diseases. He is inclined to believe that the morbid condition of the spinal cord depends mainly upon irregularity of the circulation, generally congestion.

But no essay upon the subject of spinal irritation, which had yet appeared, was equal in thoroughness to

¹ On some Forms of Cerebral and Spinal Irritation. Midland Medical Reporter, May, 1829.

that of Mr. Teale,¹ and it is to him that the views now generally held relative to the connection between various eccentric phenomena, such as pain, spasm, and visceral disturbance, and a peculiar condition of the spinal cord, are to be attributed. He, however, committed the great error of regarding the affection as being due to inflammation, and, in what for those days was logical accordance with this theory, he combated it with strong antiphlogistic measures. His book may be studied with advantage, as presenting an admirable account of the many diverse phases which spinal irritation may assume.

Mr. Tate,² in his work on hysteria, attributes many of the protean manifestations of this disorder to spinal irritation, limited, however, to the dorsal region. He fails to recognize it as an independent disease. His treatment consists in the application of tartar-emetic ointment along the whole length of the dorsal vertebræ, and strong purgation. He discountenances the use of leeches and blisters.

Mr. W. R. Whatton³ insists chiefly upon the liability to mistake spinal irritation for disease of the vertebræ. He gives a very excellent account of the symptoms. The treatment he recommends consists in the abstraction of blood, by leeches or cups, from the parts where the tenderness is felt, repeated every three or four days, and the application of small blisters on each side of the painful spots. Any debility ensuing in consequence of this treatment is to be remedied by the preparations of iron and quinine.

¹ A Treatise on Neuralgic Diseases dependent upon Irritation of the Spinal Marrow and Ganglia of the Sympathetic Nerve. London, 1829.

² A Treatise on Hysteria. London, 1830.

³ On Spinal and Spino-Ganglial Irritation. North of England Medical and Surgical Journal, No. III., 1831.

In a clinical lecture delivered in Dublin, Dr. Corrigan¹ relates the particulars of several cases of spinal irritation, successfully treated by local antiphlogistic measures, and the internal use of iron. He does not, however, add any thing of importance to our previous knowledge of the subject.

Dr. Isaac Parish,² of Philadelphia, appears to have been the first American author who called attention to the affection in question. He relates the details of several cases, recommends the use of counter-irritants, especially tartar-emetic ointment, and concludes :

“First, that tenderness on pressure in some portion of the spinal cord is an attendant on many chronic neuralgic affections, and that, by relieving it in the manner proposed, these complaints are either entirely eradicated or temporarily suspended.

“And secondly, that the precise indications which this circumstance affords are not sufficiently understood at the present time to justify the establishment of any definite pathological principles applicable to the whole class of neuroses.”

Dr. W. Griffin and his brother, Mr. D. Griffin,³ of Limerick, were the next to write upon the subject. The joint work of these gentlemen is based upon one hundred and forty-eight cases, all of which are thoroughly analyzed, and from which very definite deductions of pathology and treatment are drawn. The es-

¹ *Medico-Chirurgical Review*, July, 1831, p. 182.

² *Remarks on Spinal Irritation as connected with Nervous Diseases : with Cases.* *American Journal of the Medical Sciences*, vol. x., 1832, p. 223.

³ *Observations on the Functional Affections of the Spinal Cord and Ganglionic Nerves, in which their Identity with Sympathetic, Nervous, and Simulated Diseases is illustrated.* London, 1834.

say is not excelled in importance by any previous contribution, and constitutes a really valuable study. The conclusions which they draw are so instructive that I do not hesitate (though by no means indorsing them all) to transfer them without abbreviation:

“1. That tenderness at one or more points of the spine is an attendant on almost all hysterical complaints, on numerous cases of functional disorder when the hysteric disposition is not so obvious, and in many nervous or neuralgic affections.

“2. That many of the symptoms of these affections evidently depend upon a peculiar state of certain nerves, probably at their origin, may be reproduced at any moment by pressure, and are often relieved by remedies applied there.

“3. That, in all cases of tenderness of the cervical and upper dorsal spine, there was nausea, or vomiting, or pain of stomach, or affections of the upper extremities; but no pain of the abdomen, dysury, ischury, hystericalgia, or affections of the lower extremities.

“4. That, in all cases of dorsal tenderness, pains affecting the abdomen, bladder, uterus, testes, or lower extremities, were usual symptoms; while nausea, vomiting, or affections of the upper extremities, were never complained of.

“5. That nausea and vomiting appeared to have more relation to tenderness of the cervical spine, pain of stomach to tenderness of dorsal; but that, when there was soreness of both, nausea or vomiting was still more frequent, and pain of the stomach scarcely ever absent.

“6. That, when several points or a great extent of the spinal column is painful and tender on pressure,

local remedies are generally less effectual, and there is a strong disposition to transference of the disordered action from one organ to another; the pain or tenderness, in all such cases of transference, shifting its place to a corresponding part of the spinal column, leaving the original point free, or with a very diminished degree of tenderness.

“7. That spinal tenderness is seldom or never met with in cases of pure inflammation, except when these accidentally occur in persons previously suffering from irritation of the cord; and that, when appearances of inflammation present themselves in any organ accompanied by a corresponding spinal tenderness, they cannot commonly be removed by the remedies applicable to inflammatory cases, and are often rendered worse by them.

“8. That there does not appear to be a complaint to which the human frame is liable, whether inflammatory or otherwise, which may not be occasionally irritated in disturbed states of the cord; and hence that this disturbed state is one vast source of those complaints called hysterical or nervous.

“9. That those functional disorders connected with spinal tenderness are very often attended by some disturbance of the functions of the uterus, but that they are by no means always so, since they occur in those who are regular in this respect: in girls long before the menstrual period of life, in women after it has passed, and, lastly, in men of nervous susceptible habits, and in boys.

“10. That in fact they are not necessarily dependent upon any one organ; since they are found indifferently coexisting with disturbance of the digestive or

gans solely, or the uterus solely, or of the circulatory or respiratory system.

"11. That from the cases detailed we have reason to suppose spinal tenderness may arise from uterine disorder, from dyspepsia, from worms in the alimentary passages, from affections of the liver, from mental emotions, from the poison of typhus, from marsh miasmata, from erysipelatous, rheumatic, and eruptive fevers, and from the irritation arising from local injury.

"12. That it is almost invariably found, in connection with gastric or abdominal tenderness, in fever; and this tenderness is probably like the soreness of scalp, pains in the limbs, etc., dependent on the morbid state of the cord.

"13. That, whether in fever or in other complaints, it is met with in the situation of the eighth or ninth dorsal vertebra much more frequently than at any other part of the spine.

"14. That affections attended by spinal tenderness are seldom fatal; that, even in those cases of intense irritation of the cord under which patients suffer extremity of pain for years, the event is generally favorable.

"15. That they frequently, as well as hysteria, occur with all the appearances of a primary affection of the nervous system.

"16. That affections are occasionally met with presenting all the marks of the hysteric character, and perfectly resembling cases described as those of spinal irritation, but unattended by spinal tenderness or any other direct indication of a morbid state of the cord."

The treatment recommended consists in the removal of the cause if this still continues in action, purgatives,

the application of blisters and leeches to the skin, the internal administration of hyoscyamus and belladonna, to lessen the nervous irritability, alum in cases of gastric derangement, and change of air and scene.

In a subsequent work, the Messrs. Griffin¹ again discuss the subject, but bring forward no additional facts.

Dr. John Marshall² is confident that many visceral affections, such as heart-diseases, asthma, phthisis, dyspepsia, diabetes, chorea, and even phlegmasia dolens, are frequently really produced or simulated by spinal irritation. Some of his cases of supposed functional disorder of the spinal cord are, however, obviously organic, consisting of congestion, inflammation, or softening of the organ.

In his classical work, Ollivier³ devotes considerable space to what he calls "*an Affection described under the name of Spinal Irritation.*" He considers the pathological condition to be one of congestion of the meninges of the cord, and bases this opinion in great part on the success which, according to him, ensues on the use of leeches, blisters, and counter-irritant ointments. In addition, he favors the administration of opium, digitalis, hyoscyamus, belladonna, and subcarbonate of iron.

Türk⁴ regards the phenomena of spinal irritation as being due, first, to disorder of other organs, whereby

¹ Medical and Physiological Problems: being chiefly Researches for correct Principles of Treatment in Disputed Points of Medical Practice. London, 1845.

² Practical Observations on Diseases of the Heart, Lungs, Stomach, Liver, etc., occasioned by Spinal Irritation, and on the Nervous System in General as a Source of Organic Disease. London, 1835.

³ Traité des maladies de la Moelle Épinrière. Troisième édition. Paris, 1837, t. seconde, p. 209.

⁴ Abhandlung über spinal Irritation. u. s. w. Wien. 1843.

a morbid impression is propagated along the incident excitor nerves to the spinal cord, or, second, to derangement of the capillary circulation of the cord. That is, the disease may be either of eccentric or centric origin. He does not advance our knowledge beyond the point reached by previous authors.

Coming again to our own country, we find that in 1844 a very valuable paper was published by Prof. Austin Flint,¹ based upon fifty-eight cases of functional disorder connected with an abnormal condition of the spinal cord. In this memoir, without going into any discussion relative to the pathology of the affection, Dr. Flint considers the disorder as giving rise to tenderness over the vertebral column, causing alterations of sensibility, as affecting the muscular system, as producing abnormal mental manifestations, as affecting the digestive organs, the genito-urinary organs, the heart and circulation, and as causing paroxysms of sinking. He then considers the physical habits of the patients, the results of medical treatment, the probable remote causes, and then, at some length, the remedial measures which he has found most successful. Under this head, Dr. Flint advises the use of counter-irritants to the spine, especially cupping, and generally without scarification. Issues he found inapplicable, death ensuing in the one case in which he used them. There is no doubt, however, that in this instance he had an organic disease to deal with, and that the issues had nothing to do with the fatal result. Tonics, especially iron, he found to be of great advantage.

In a very full analysis of the medical reports of the Stockholm Hospital, by Dr. Magnus Huss,² the subject

¹ Observations on the Pathological Relations of the Medulla Spinalis. American Journal of the Medical Sciences, April, 1844, p. 269.

² British and Foreign Medical Review, October, 1846, p. 463.

of spinal irritation receives due consideration. Dr. Huss classes the symptoms of the disorder as follows: 1. Pain of various parts of the vertebral column, existing either idiopathically or developed by pressure. 2. Cramps, either of a clonic or tonic nature, in those parts subjected to the influence of the spinal cord. 3. Loss of power in the same portions of the body, ranging from simple stiffness and weakness to complete paralysis. 4. Altered sensibility, either by excess or by great diminution of sensation.

It will be observed that in this enumeration the author confines his specification of morbid phenomena to those which relate to sensation and the power of motion.

The treatment is fully and philosophically considered. Of external remedies he prefers counter-irritants, using the milder forms first, and then the severer, such as the moxa and the actual cautery, should the first fail. Venesection, either general or local, should be cautiously employed, and is not generally indicated. He is the first, so far as my researches extend, to mention electricity, a means which he thinks may be employed with advantage in chronic and debilitated cases. Potash-baths are also recommended.

Of internal remedies he specifies iron, opium, strychnia, phosphorus, and valerian, as being preëminently useful.

Axenfeld¹ devotes a considerable portion of his treatise to spinal irritation. He regards it as being produced either by a trouble of innervation or congestion. In the treatment, leeches occupy the first place, and in light cases blisters, sinapisms, dry cups, and stimulating frictions, are useful. Internally he recommends nothing but quinine and iron.

¹ Des Névroses, Paris, 1863, p. 284.

Dr. Radcliffe¹ writes very sensibly on the subject of spinal irritation, and gives a typical case which is quite instructive. He incidentally gives it as his opinion, that the pathological condition is one of anæmia, and he consequently discourages the use of leeches, relying mainly on blisters and tonics.

I have thus cited the principal authorities upon spinal irritation, without, however, by any means, exhausting the bibliography of the subject. Notwithstanding the eminence of many of those who have contended for the existence of a definite affection of the spinal cord, characterized by tenderness on pressure over one or more of the vertebræ, and certain eccentric disorders involving sensibility, the power of motion, and functional derangement of many of the viscera, it must be confessed that the great mass of the medical profession has regarded the whole theory with suspicion, if not with absolute distrust. The principal reason for this is undoubtedly to be found in the fact that, like many other new theories, that of spinal irritation has been applied to explain conditions which it could not logically be made to cover. Thus many cases of disease or disorder of the heart, due to organic difficulties of that organ, or excited by disease of other viscera through the sympathetic system, have been attributed to spinal irritation. The same is true also of the uterus, stomach, liver, and other organs, and even of the spinal cord itself, which often, when the seat of organic diseases, such as congestion, meningitis, inflammation, tumors, etc., has been regarded as simply in a state of irritation. It is very certain, also, that numberless cases of hysteria have been attributed to irritation of the spinal

Reynold's System of Medicine, London, 1868, vol. ii., p. 640.

cord. In the following remarks I will endeavor to be as explicit as possible, and not to claim too much for a pathological condition which I am very sure exists, and which I therefore think is entitled to recognition. If I contribute any additional information, it will be mainly due to the fact that our means of examination are much more perfect and extensive, and our knowledge of physiology, pathology, and therapeutics, more thorough than when most of the authors I have quoted wrote upon the subject. My observations are based upon a careful study of eighty-three cases which have occurred in my private practice during the last five years, and of which I have full notes, and twenty-nine cases of which I have less complete data—in all, one hundred and twelve cases.

SYMPTOMS.

CENTRIC SYMPTOMS.—1. *Tenderness at some one or more Points over the Spinal Column, increased by Pressure.*—This is the essential symptom of spinal irritation, though varying in intensity from the slight degree of pain experienced upon strong pressure to the acute hyperæsthesia, which does not allow of even the contact of the clothing without the production of great suffering. It is generally complained of by the patient, though occasionally it has to be sought for by the physician. The brothers Griffin found this symptom present in all but five out of one hundred and forty-eight cases, and it is very probable that these five were not cases of spinal irritation, a supposition which the authors themselves evidently entertain. Certainly the details of the cases do not support the view which would ascribe their phenomena to any affection of the spinal cord. Most of the other authors I have cited refer to

this tenderness as a prominent feature. Parish thinks it alone is to be relied upon as indicating irritation; Mr. Whatton declares that it is never wanting; Axenfeld regards it as the dominant and characteristic symptom; and Radcliffe, while admitting that it is not equally well marked in every case, states the rule to be that spinal tenderness and spinal irritation go together.

On the other hand, Flint does not regard tenderness as an invariable and essential element of the affection under consideration. He found it absent or indistinct in five of his fifty-eight cases, while the other attendant circumstances furnished unequivocal evidence that the diagnosis was correct.

My own opinion would lead me to consider no case as one of spinal irritation in which tenderness on pressure over the vertebræ was absent. In the one hundred and twelve cases noted by me, this symptom was present in all. There are diseases of the spinal cord, which produce derangements of other organs of the body, and which are not characterized by vertebral tenderness, but these are far more serious affections than spinal irritation, and of altogether different pathology.

The seat of the tenderness is generally in the dorsal region of the spine. The Griffins found cervical tenderness in twenty-three cases, cervical and dorsal tenderness in forty-six, dorsal alone in twenty-three, dorsal and lumbar in fifteen, lumbar in thirteen, and the whole spine tender in twenty-three. Of one hundred and forty-eight cases, therefore, one hundred and seven exhibited tenderness in the dorsal region.

Dr. Flint found cervical and dorsal tenderness in three cases, lumbar and dorsal in ten, and dorsal alone in twenty-one cases.

Of my own cases, fifteen had cervical tenderness only, thirty-two cervical and dorsal, thirty-four dorsal only, twelve dorsal and lumbar, nine lumbar only, and in ten the whole spine was tender. Eighty-eight cases, therefore, of one hundred and twelve were characterized by dorsal tenderness, and in thirty-four it was limited to this region.

The degree and character of the tenderness are subject to great variation. In some cases strong pressure is required to develop it, while in others the least touch is insupportable. Sometimes there are shooting pains, which radiate from the tender spot, while at others the hyperæsthesia is quite circumscribed. In a gentleman now under my care with well-marked spinal irritation, and who has a tender spot over the third lumbar vertebra, pressure not only causes intense suffering at that point, but develops pain along the whole course of the crural nerves and their branches as far as their terminations on the inner sides of the feet. Another, a lady, who has spinal tenderness over the eighth cervical and first dorsal vertebræ, experiences, from pressure, intense pain along the course of the first intercostal, the internal anterior thoracic, and all the nerves of the left upper extremity. Why in these and other cases particular nerves should be affected, is a question which will be more fully considered hereafter.

The pain developed by pressure is not always of the same character. Sometimes it is dull and aching, and at others sharp and lancinating. I have not noticed that any very definite relation exists between the character of the pain and the severity of the other symptoms, though, as regards the degree of pain of each kind, there is a marked connection. By this I

mean that a dull, aching sensation may indicate as profound a pathological condition, and be accompanied by as intense eccentric phenomena, as a sharp and lancinating pain, though a severe aching pain and a severe lancinating pain always indicate more serious disorder than when these sensations are not so emphatic.

The character of the pain varies in accordance with the tissue in which it is felt. The dull aching sensation is only developed by strong pressure, and is seated in the muscular, tendinous, or cartilaginous structures about the vertebræ. The sharp, piercing twinges excited by slight pressure arise from the skin, and subcutaneous cellular tissue. With these species of sensations, the æsthesiometer always shows increased sensibility of the skin, over and in the vicinity of the painful centres.

To ascertain whether or not the tissues outside of the spinal canal are in a state of hyperæsthesia, the pressure should be applied with gradually-increasing force, by means of the thumbs applied to the spinous processes and the intervertebral spaces, as recommended by Flint. The examination should be thorough, and extend throughout the whole extent of the vertebral column. The fact that the patient denies the existence of tenderness should have no weight with the physician. Only a few days ago a young lady consulted me for severe infra-mammary pain, headache, and nausea. I at once suspected spinal irritation, but she declared, in answer to my inquiries, that there was no sign of tenderness anywhere over the spinal column. I insisted, however, on a manual examination, and to her great surprise found three spots that were exceedingly painful to slight pressure. This young lady had been treated for dyspepsia for several years, without

deriving any benefit from the measures used, but was cured by the treatment which I shall presently fully consider. Occasionally it happens that the tenderness is not perceived for some time after the pressure is made. In a recent case I found the interval to be over a minute, and then acute pain, following the course of the nerves, was experienced. I am not prepared to offer an explanation of this phenomenon.

2. *Pain in the Spinal Cord.*—The tenderness just noticed is seated primarily externally to the vertebral canal, and is developed by pressure. That which is now to be considered is located in the spinal cord, and is therefore capable of being produced by pressure upon non-tender spots. It is a very common symptom, having been present in one hundred and one of my cases. Generally it is confounded with spinal tenderness, from which, however, it is quite distinct. It is aggravated by motion of the spinal column, by action of the muscles which have their attachments to the spinous and transverse processes, by percussion and sometimes by the erect posture. In the case of a gentleman of this city, it was so great when he stood up that he was forced to keep the recumbent position nearly the whole time. When I first saw him he was wearing an apparatus designed to keep the weight of the head from the vertebral column, and to prevent the vertebræ pressing upon each other, under the idea that he had disease of the intervertebral substance. I removed the instrument, and, treating him for spinal irritation, he recovered his health in a few weeks.

Pain in the spinal cord, in the disorder under consideration, is usually seated near the point of external tenderness, though it is often at a distance, and sometimes is felt throughout the whole extent of the cord.

The eccentric phenomena bear a distinct anatomical and physiological relation to it, as do those which are connected with spinal tenderness. There is likewise a similar connection existing between the pain in the cord and the vertebral tenderness.

To ascertain the existence of spinal pain, when it is not spontaneously felt or superinduced by muscular exertion, percussion should be practised. The ends of the fingers will answer for this purpose, though I prefer a little vulcanized india-rubber hammer, and a plesimeter, such as are sometimes used for percussing the chest. Even over spots which exhibit much tenderness, the deep-seated pain in the cord itself can clearly be distinguished.

ECCENTRIC SYMPTOMS.—By far the most important and noticeable symptoms of spinal irritation are to be found in distant parts of the body. These vary in their character and seat, according to the part of the spinal cord affected. Following the example of the Griffins, I shall consider these symptoms as they depend upon irritation of the several regions of the cord with which they are connected.

a. The Cervical Region.—Of the cases upon which this paper is based, in fifteen the irritation existed in the cervical region only, of the spinal cord; in thirty-two, the cervical tenderness was conjoined with dorsal tenderness, and in ten with tenderness of the whole spine. Taking the uncomplicated cases as presenting the clearest features, the following would appear to be the more prominent symptoms of cervical spinal irritation.

Vertigo was an accompaniment in seven cases, and *headache* in nine; *noises in the ears* in five, and *disturbances of vision* in four. *Fulness* and a *sense of*

constriction across the forehead were complained of in several cases, as was also tenderness of the scalp. In addition, the *mind* was more or less affected in every case, and in six the aberration was of such a character as almost to amount to insanity. In one of these, a married lady, aged thirty, there were several paroxysms of maniacal excitement every day; and in another, that of a young lady aged twenty-three, so furious were the exacerbations that, for fear she would injure herself or others, she had to be restrained by two strong nurses, who held her while the fits lasted. The predominant type, however, was melancholia.

Sleep was deranged in every case, generally in the form of insomnia, though in three cases the tendency to somnolence was excessive. In every case the dreams were of an unpleasant character; in two there was nightmare, and in one somnambulism.

Neuralgic pains were present in twelve of the fifteen cases. If the upper part of the cervical region was the seat of the irritation, these pains were experienced in the scalp and face; if the lower, they were seated in the neck, the shoulders, upper part of the chest, and the upper extremities. Sometimes the pain was of a dull, burning character, and was then generally seated in the muscles of the nucha. Muscular effort always increased the suffering. In accordance with Teale's experience, it several times occurred that the neuralgia was intermittent, the paroxysms coming on about sundown and lasting through the night. In none of these cases was there anæsthesia.

Motility was interfered with in twelve cases. Sometimes there were *fibrillary twitchings*, in three cases there were *clonic spasms* of the muscles of the face and neck; in two, *general chorea*; in two, *contractions*

of the flexors of the arm on one side, so that the elbow was rigidly bent; in two, the contractions were in the flexors of the hands, and in four, of the fingers. In one case there was *complete loss of power* over the hand; in one, *aphonia*; and in one, almost constant *hiccough* while the patient was awake.

Nausea was present more or less in seven cases, and, in one, part of every thing taken into the stomach was almost immediately rejected. *Pain* in the stomach was not met with in any case.

b. The Dorsal Region.—I found the dorsal region of the spine tender in eighty-eight cases. In thirty-two of these it was conjoined with cervical, in twelve with lumbar tenderness, and in ten it was affected with the whole spine, leaving thirty-four uncomplicated cases.

The most prominent symptoms in these cases were connected with the viscera, the stomach being the organ commonly involved. Thus *gastralgia* was present in every case, *nausea* and *vomiting* in seven cases, *pyrosis* in three, *gastric flatulence* in thirty-two, and *acidity*, as evidenced by heartburn, in twenty-one.

Next in order came the heart. There were *palpitations* in eighteen cases, *fits of oppression*, during which the heart beat with irregularity as regarded force and rhythm, in seven cases, and *attacks of syncope* in five.

There was *difficulty of breathing* in fourteen cases, and *cough* in eleven.

Intercostal neuralgia existed in five, and *infra-mammmary pain* in twenty cases.

There were no muscular spasms, contractions, or paralysis.

In the thirty-two cases in which the dorsal tenderness was conjoined with cervical tenderness, the symp-

toms characteristic of each region were more or less intermingled. In two cases there was *epilepsy*, and in three *chorea paralytica*.

c. *The Lumbar Region*.—This portion of the spine exhibited tenderness in thirty-one cases. In twelve of these it was accompanied by dorsal tenderness, in ten the whole spine was affected, and in nine the tenderness was confined to the lumbar region alone. Of these latter all were characterized by *neuralgic pains* in the lower extremities, and in three of them there were similar pains in the muscles of the back and abdomen. In four there was *spasm of the neck of the bladder*, accompanied by severe pain, and causing great difficulty of urinating, in one there was *incontinence of urine*, in two *pain in the uterus and ovaries*, and in one *neuralgia of the rectum*.

Motility was affected in seven cases. In three of these there were strong *tonic contractions* of the muscles of the lower extremities, and in four *paralysis*. In all of these there were occasional *clonic spasms* simulating chorea. Of the twelve cases in which there was also dorsal tenderness, the symptoms were in general those characteristic of spinal irritation of both regions.

The whole spine was tender in ten cases, and so extensive was the hyperæsthesia that it was scarcely possible to press upon the most limited spot without producing pain. Of these cases the most prominent symptom in one was *epilepsy*, in one *paralysis*, sometimes of the upper and sometimes of the lower extremities, and in three *contractions* of the limbs. *Neuralgic pains* either in the scalp, face, neck, chest, upper extremities, abdomen, and lower extremities, were present in every case, according to the part most severely affected

for the time being. The heart was disordered in two cases, the stomach in nine, in three there was *difficulty of swallowing*, from alternating paralysis, and spasm of the muscles of the larynx, and in one *aphonia*.

CAUSES.

The most powerful predisposing cause is *sex*. Of the one hundred and twelve cases, ninety-three were females. Age is likewise influential in determining to the disorder. Of eighty-three cases in which I have recorded the age, fifty-one were between fifteen and twenty-five, thirteen between twenty-five and thirty-five, ten under fifteen, and nine over thirty-five. The period of life between fifteen and twenty-five is therefore that at which spinal irritation is most apt to occur.

Hereditary influence was ascertained to exist in eighteen cases.

The exciting cause of spinal irritation is not always easy to ascertain. In seventeen of eighty-three cases I could not, by the most careful inquiry, find any circumstance likely to have given it origin. In fifteen it was manifestly produced by blows, falls, or strains, in seven it was obviously caused by sexual excesses, and in two by onanism. In three there was reason to ascribe it to anxiety and grief, in two to excessive mental exertion, in ten to insufficient physical exercise, in twelve to innutritious and insufficient food, in three to over-indulgence in alcoholic liquors, and in one to the use of opium. In the remaining eleven cases it followed exhausting diseases, such as typhoid, scarlet, and intermittent fever, dysentery, and diphtheria, and was probably directly the result of their influence.

In general terms, it may be said that any cause capable of reducing the powers of the system, may produce spinal irritation.

PATHOLOGY.

I have already stated it as my opinion that the essential condition of spinal irritation is anæmia of the cord. Other writers have ascribed it to inflammation, congestion, hysteria, and numerous other factors. The reasons which have induced men to arrive at this conclusion are briefly as follows: Owing to the fact that spinal irritation is not *per se* a fatal disease, we rarely have the opportunity to verify any views we may hold in regard to its pathology. In the few cases in which *post-mortem* examinations were made nothing abnormal was found, a circumstance, however, far more compatible with the idea I have expressed than with any other.

1. It is a well-recognized fact that irritation is often a result of a deficient supply or a poor quality of blood. Thus headaches are frequently caused by cerebral anæmia, and are promptly relieved by increasing the amount of blood in the cerebral blood-vessels. Irritability of the mind is also a constant accompaniment. A feebly-nourished stomach rejects food, and is the seat of pain. An anæmic heart beats with great rapidity, weak muscles are affected with tremor, and an exhausted generative system is brought into a state of unnatural erethism by the slightest kind of excitation. Analogy, therefore, supports the theory I have suggested.

2. The diagnosis of diseases of the spinal cord has become so perfect that we are able to distinguish congestion, meningitis, myelitis, softening, tumors, etc., by their symptoms and by the means of research at our command. We see, therefore, that the morbid phenomena which result from such conditions are not such as we now class under the head of spinal irritation.

This division of the subject will be more fully considered under the head of diagnosis.

3. I have repeatedly ascertained, by actual experience, that those agents which are known to lessen the amount of blood in the spinal vessels invariably increase the severity of the symptoms due to spinal irritation, while they are as effectually lessened in intensity by remedies which tend to produce spinal hyperæmia.

4. The general condition of patients the subjects of spinal irritation is always below par, and the exciting causes are all such as tend to the production of asthenia.

These circumstances, I think, go very far toward confirming the view I have expressed, that in spinal irritation the vessels of the cord contain less blood, and that this fluid is inferior in quality, than when the organ is in a healthy condition. Now that the function of the sympathetic nerve, as regards its action in regulating the calibre of the blood-vessels, is so satisfactorily proven, we can partially understand how local congestions and anæmias may be superinduced. It is probable, therefore, that the original difficulty in many cases of spinal irritation resides in the sympathetic system, and the intimate anatomical relations existing between the two nervous centres is strongly in favor of this suggestion.

On the other hand, many of the phenomena of spinal irritation point strongly to the secondary involvement of the sympathetic system. It is thus that the visceral disturbances which form such prominent features are mainly to be explained.

The pathology of several others of the more striking symptoms of spinal irritation has been a subject of frequent discussion, but at the present day presents

no difficulties. Thus the excitation of pain in the tissues to which the cutaneous nerves are distributed results from the law that irritation at a nervous centre induces pain at the points in which the nerves arising from that centre end. Each compound spinal nerve sends a twig to the skin contiguous to it, and these twigs terminate immediately over the spinous processes. Now, whenever an irritation is thus transmitted to the periphery, it may be reflected back to the centre whence it came, by local irritations. Thus a patient is suffering from chronic inflammation of the spinal cord, and in consequence has pain and muscular spasms in his lower extremities. An irritation applied directly to the cord increases the pain and spasms; an irritation applied to the lower extremities augments the pain in the cord, and may induce pain and spasms in distant parts of the body. Hence it is that pressure on the skin over the spinous processes not only causes cutaneous pain, but also gives rise to spinal pain, and neuralgic sensations in those nerves which come from the irritated part of the cord.

The pain existing in the cord is aggravated by percussion or muscular action. The spinal cord, it is true, is enclosed in a strong and thick, bony canal, which, however, is entirely filled by its contents. A blow, therefore, on the exterior of the column causes a vibration, which is propagated through the bony structure to the cord and its membranes. If this blow be very violent, the concussion may be such as to inflict irreparable damage on the cord. When any portion of the cord is in a state of irritation, a very light blow upon the spinous processes, over the disordered part, will cause severe pain, or notably add to that already present. The vertebral column is flexible,

and therefore muscular action may, by producing deviations from the ordinary line followed, occasion pressure, and, in the abnormal condition of the cord, excite pain.

DIAGNOSIS.

Recollecting that no case is to be regarded as one of spinal irritation which is not characterized by spinal tenderness, we have our diagnostic inquiries limited to the distinguishing of spinal irritation from other spinal affections. It is certainly true that the distinction has often been overlooked, and that at times there is a real difficulty in forming a correct judgment. Nevertheless, by carefully estimating all the circumstances, permanent errors of diagnosis are not likely to occur.

There are three diseases of the spinal cord which may in their earlier stages be confounded with simple spinal irritation. These are chronic myelitis, meningitis, and congestion. As the treatment of these affections is in many respects the exact reverse of that proper for spinal irritation, and as they are of far more serious character, it is important to make as early and as correct a discrimination as possible.

In both spinal irritation and myelitis there is tenderness over some part of the vertebral column, which tenderness is increased by pressure, but this tenderness is never due to hyperæsthesia of the skin, whereas in spinal irritation it often is.

In spinal irritation there is never, so far as my experience goes, anæsthesia, whereas this is a constant accompaniment of myelitis.

The contractions which take place in some cases of spinal irritation are painless, while those due to myelitis are attended with great suffering.

In myelitis there is a sensation as if a tight cord

were tied around the body at the upper limit of the paralysis, a sensation which is always absent in spinal irritation. It is true that Mr. Teale has described several cases which he classed as spinal irritation and in which the sensation of constriction was present, but careful examination of the histories leaves scarcely a doubt that these were really cases of myelitis.

The bladder is never paralyzed in spinal irritation, whereas, in myelitis, it generally is, if the inflammation be located in the lower dorsal region of the cord. The same is true of the sphincter ani. Myelitis is always productive of paralysis, and there is always more or less atrophy of the paralyzed muscles. Spinal irritation seldom gives rise to paralysis, which, when it does result, is always incomplete, and is never productive of atrophy.

The progress of myelitis is generally, unless arrested by appropriate treatment, toward a worse condition, whereas no such tendency is manifested by spinal irritation.

From spinal meningitis, spinal irritation is distinguished by the circumstances that in the former disease there are constant painful spasms of the muscles of the back, pain in the cord, and no spinal tenderness increased by pressure.

From congestion of the spinal cord and its membranes, spinal irritation is sufficiently distinguished by the facts that there is little or no pain in the cord in the first-named affection, and no spinal tenderness. In congestion, likewise, the paralysis and other symptoms are always worse after the patient has been lying down, while in spinal irritation the recumbent position always alleviates the condition.

Another means which in doubtful cases will inva-

riably lead to a correct diagnosis is afforded by the known effects of certain medicines. Thus spinal irritation is, as I have several times ascertained, made worse by the administration of ergot, while each one of the other diseases I have named is alleviated. The reverse is true of strychnia, which in all cases aggravates the symptoms of myelitis, meningitis, or congestion, while it is an efficient means of cure in spinal irritation. A hypodermic injection of the thirtieth of a grain is sufficient to settle the matter in cases where the diagnosis is of difficult formation.

The flatulence, eructations, and vomiting, are very symptomatic of spinal irritation, while they are rarely phenomena of either of the other affections.

One other disease is liable to be confounded with spinal irritation, and that is angular curvature, in which there is spinal tenderness increased by pressure. The facts, however, that strumous disease of the vertebrae generally occurs in children, that the scrofulous diathesis is always present, that an angular prominence can be detected by careful examination, that the paralysis progressively becomes more profound, that the constitutional effects are more severe, are sufficient, even in doubtful cases, to guide to a correct diagnosis.

PROGNOSIS.

The prognosis in cases of spinal irritation is generally favorable. In fact, so far as my experience extends, I have never seen a case which entirely resisted treatment, and very few in which a cure was not ultimately effected. When remedies suitable for the difficulty do not prove successful, it is because the patient does not steadfastly persevere in their use.

Of the one hundred and twelve cases forming the

basis of this memoir, ninety-eight were thoroughly cured, seven were lost sight of soon after treatment was commenced, but were materially improved, and seven were relieved for the time being, but continued to have relapses.

TREATMENT.

The principles of treatment applicable to spinal irritation are four:

1. To remove the cause.
2. To improve the general tone of the system.
3. To increase the amount of blood in the spinal cord, and improve the nutrition of this organ.
4. To set up a counter-irritant action in the vicinity of the disordered region of the cord.

In regard to the first indication, I have nothing special to say. The cause once ascertained, common-sense would dictate its removal as speedily and as effectually as possible, by the proper means according to its character.

The second indication is to be met by tonics, such as quinine and iron, and especially stimulants judiciously administered. I am as well convinced of the general applicability of alcohol in some form, in the treatment of spinal irritation, as I am of any thing. Whiskey, brandy, and rum, are to be preferred on account of their less liability to disagree with the stomach, and as containing a greater percentage of alcohol than vinous or malt liquors. Among the tonics the preparations of zinc are valuable, and I think the oxide is to be preferred. Cod-liver oil is also of great service.

The third indication is easily fulfilled by strychnia, phosphorus, phosphoric acid, and opium. The two first-named remedies may be very satisfactorily combined in a pill containing half a grain of extract of nux

vomica and the tenth of a grain of the phosphide of zinc, which may be given three times a day. Strychnia may also be given by solution of the sulphate in dilute phosphoric acid, and in doses of about the thirty-second of a grain to half a drachm of the acid. The beneficial effects of these remedies are perceived in a few days. Opium is especially useful in those cases in which there are contractions of the limbs, and here its action is, of course, not solely that of an agent increasing the amount of blood in the cord. I prefer to give it either in the form of suppositories, composed each of half a grain of the aqueous extract and a sufficient quantity of the butter of cacao, or by hypodermic injection of morphia. I have frequently seen contractions, which had persisted with obstinacy for several weeks, relax in a few minutes under the influence of opium thus administered.

The application of hot water to the spine is also an admirable adjuvant. It should be used as hot as can be borne. Nothing is better for the purpose than Dr. Chapman's india-rubber bags.

But there is a remedy which we can employ either to contract or enlarge the diameter of the blood-vessels, and which, when used with the latter object in view, is more efficacious in removing spinal irritation than any other with which I am acquainted, and that is the direct galvanic current. The method I follow in cases of spinal irritation is the application of the negative pole at some point above the seat of the pain, and the positive at another, an equal distance below. An ascending current is thus brought to bear upon the cord, and this powerfully conduces to the dilatation of the blood-vessels and the improvement of the nutrition of the cord. The current should not be passed at

any one *séance* for more than fifteen minutes, and no one application should last longer than three or four minutes. For the relief of the spinal tenderness the negative pole should be applied directly to the painful part, and the positive to a point distant laterally from it a few inches.

In inflammation or congestion of the cord or its meninges, the method of application is directly the reverse of this.

The fourth indication is one of great importance, and, when properly carried into effect, a cure will often result in slight cases without any other means of treatment being employed. The *rationale* of the action of counter-irritants in this and similar derangements is by no means clearly understood. It is a question which I do not, however, propose to discuss. Of counter-irritants my experience leads me decidedly to the employment of blisters in preference to any others. They should be applied to the skin, immediately over the painful part of the spine, and should be renewed as often as may be necessary. Tartar-emetic ointment, though useful, is more painful and I think not so efficacious as blisters. Dry cups are more admissible, and almost always do good. They should be applied on each side of the spinous processes for an extent of four or five inches above and below the painful spot. Leeches, or any other means for the abstraction of blood, are, according to my experience, always prejudicial.

Besides these therapeutical means, there are others of a more strictly hygienic character, which cannot be overlooked. Thus the food should be of a highly-nutritious character, moderate physical exercise should be taken, and as much time as possible should be spent in the open air.

Patients almost always feel more comfortable in the recumbent position than any other, because thereby the blood is allowed to settle in the spinal vessels. They should not therefore be prevented lying down during the greater part of the day, but at the same time they should be encouraged to take exercise, and especially so when there is any loss of power in the lower extremities. The induced or Faradaic current is almost always of service, when applied to the affected muscles, and the direct is of great efficacy when passed through neuralgic nervous trunks.

In illustration of the views inculcated in this memoir, I append the following details of cases:

CASE I. *Irritation of the Cervical Region of the Spinal Cord*.—Mrs. J. S. consulted me, May 7, 1868, for what she had been informed was a cerebral disorder. The patient was thirty-eight years of age, had had five children, and had always enjoyed good health till two years previously, when she had been thrown from her carriage. She was not stunned or otherwise seriously injured. Soon after the accident she noticed a rumbling noise in one ear, and in a few days subsequently the other ear became similarly affected. About the same time there were flashes of light before the eyes, and a dull, heavy pain in this point of the head. Vertigo was also frequently present. There was insomnia, and when she did sleep she was very apt to be attacked with nightmare.

These symptoms continued to annoy her for several months, without, however, compelling her to seek for medical advice, until at last she had a seizure which was certainly epileptic in its character. This was followed with disturbance of vision, and intense neuralgia of the fifth pair of nerves. She now placed herself

under the charge of a physician in a neighboring city, where she was then residing, who diagnosed a tumor of the brain, and gave an unfavorable opinion as to the ultimate result. He, however, advised the use of iodide of potassium. She took this in large doses faithfully for three months—during which period she had two more epileptic attacks—without perceiving any benefit, and then she went to Europe. While there she consulted a number of physicians and surgeons of eminence, all of whom gave a very guarded prognosis. By the advice of several of these she took the bromide of potassium, with, at first, some advantage, but this was eventually lost, and her symptoms became as severe as before. She had several epileptic paroxysms during the four months she was taking the bromide. Finally, she travelled through Germany and Italy, and, still obtaining no relief, returned home. I saw her a few days after her arrival. She was then suffering from facial neuralgia, excessive tenderness of the scalp, so that she could not have her hair brushed without enduring great pain, obscurity of vision, pain in the eyeballs, redness of the conjunctivæ, vertigo almost constantly, great mental irritability, amounting at times to positive insanity; wakefulness, nightmare, and contraction of the fingers, the nails being strongly pressed against the palm of the hand.

Ophthalmoscopic examination showed dilatation of the retinal vessels, arterial and venous pulsation, and congestion of the optic disks of both eyes. The pupils of both eyes were contracted.

Perhaps I should not have suspected any spinal difficulty, if she had not herself called my attention to a pain which she said she constantly felt between the shoulders. I therefore examined the upper part of the

spine very carefully, and found deep-seated pain developed by percussion over the seventh cervical vertebra, and great hyperæsthesia of the skin over the eighth. Her symptoms were not those in the least indicative of congestion of the cord or its membranes, of meningitis, or myelitis, and the apparent severity of the cerebral symptoms, and the general good condition of her mind and sensorial and motor functions, were so incompatible, that I could not, upon reflection, bring myself to the belief that she was affected with any organic disease of the brain. My inquiries and examinations all led me to the conclusion that she was laboring under spinal irritation of the lower cervical region.

I therefore prescribed for her five drops of the phosphorated oil three times a day, applied a blister to the painful spot, and daily passed the direct galvanic current through the cord, by applying the negative pole to the fifth cervical, and the positive to the sixth dorsal. My object was, not only to improve the nutrition of the cord, but also, by irritation of the sympathetic, to contract the vessels of the brain. Budge and Waller had shown several years previously, that, when that portion of the spinal cord situated between the seventh cervical and sixth dorsal vertebræ is acted upon by the galvanic current, the pupils are dilated. Now, dilatation of the pupils is produced by excitation of the sympathetic, and excitation of the sympathetic within the limits mentioned likewise causes contraction of the vessels of the brain, as can readily be seen by ophthalmoscopic examination while the current is passing.

Under the influence of this treatment the amendment was rapid, and at the end of three months she

was entirely cured. It was necessary, however, to apply eleven blisters.

CASE II. *Irritation of the Cervical Region of the Cord.*—M. S., a gentleman of sedentary habits, consulted me, August, 1867, for intense headache and facial neuralgia, with which he had suffered for several months. The disease had come on gradually, and, although now never entirely absent, was paroxysmal in its character, being more severe at night than through the day. The external pain followed the course of the fifth pair of nerves through all its branches; the internal was fixed in the posterior part of the head, and was evidently due to cerebral anæmia, as it was relieved by stimulants, and by holding the head in a dependent position. Vertigo was frequently present, and the disposition to sleep was excessive, though, owing to the pain, could not be indulged in for more than a few minutes at a time. Nausea was occasionally a symptom, but never to the extent of being followed by vomiting.

On examining the spine of this gentleman, I found tenderness over the fourth and seventh cervical vertebræ. Two blisters were at once applied, and Aitken's syrup of the hypophosphate of iron, quinine, and strychnia, administered. From the first, improvement was manifested, and in less than a month the cure was complete.

CASE III. *Irritation of the Dorsal Region of the Spinal Cord.*—Mrs. J. B., aged twenty-four, consulted me, March, 1868, for obstinate vomiting, and neuralgic pains in the left breast. She was thin, pale, and anæmic, and had suffered for over a year. She also complained of a dull, aching pain in the middle of the back, which was increased by even moderate physical exercise. The vomiting took place regularly after every

meal, and even water was at once thrown up. She was under the impression that the disorder was the result of exposure for several hours to very severe cold while in an open boat.

Recognizing, at once, the fact that the main difficulty lay in the cord, I carefully examined the whole spine, and found excessive tenderness over the spinous processes of the sixth, seventh, and eighth dorsal vertebræ. There was also deep-seated spinal pain developed by percussion.

I ordered the application of a blister, and the internal use of small quantities, frequently repeated, of milk-punch (one ounce of brandy to three of milk). The first wineglassful was at once rejected, and so was a tablespoonful which she took half an hour subsequently. I then reduced the quantity to a teaspoonful every half hour. This was retained, and was the first nutriment of any kind which, for nearly eleven months, had not been rejected wholly or in part.

The next day I found that the blister had drawn well, and that the nausea and vomiting were greatly diminished, as were likewise the neuralgic pains. A teaspoonful of the following mixture was then directed to be taken three times a day immediately after meals: *R.* Strychnia sulph. gr. j, ferri pyrophosph., quiniæ sulph. āā. ʒss, acid phosph. dil., syrupus zingiberis āā. ʒij. *M. ft. mist.* The milk-punch was still continued, but, in treble the dose, less frequently given.

Gradually all the symptoms decreased in violence, and at the end of two weeks she was enabled to retain a moderate quantity of food at each meal. Any excess was still, however, followed by vomiting. She had increased five pounds in weight, and was greatly improved in personal appearance.

In two months she had gained twenty-one pounds, and was as well as she had ever been in her life. The spinal tenderness had entirely disappeared; seven blisters were applied in all.

CASE IV. *Irritation of the Dorsal Region of the Spinal Cord.*—Mrs. W. had for more than three years suffered from spasmodic movements of the upper extremities, not distinguishable from those of true chorea, which occasionally were followed by contractions of the flexors of the wrists and fingers. There were also infra-mammary pain, eructations, and vomiting. When she came under my care, June 22, 1869, she was reduced to almost a skeleton, and was suffering, in addition to the symptoms above mentioned, from acute pain in the back. This pain she informed me had not been ordinarily very severe, but was, nevertheless, constantly present. On examination I found tenderness over the first, second, and third dorsal vertebræ. I at once applied the constant galvanic current in the manner already described, and continued it for five minutes, with the effect of mitigating the pain in the spine and the nausea. The ensuing day I repeated the application, and in addition prescribed the mixture given in Case III. She retained it on her stomach, as she did the food which she ate that day. Brandy in ounce-doses was given with her lunch and dinner. The galvanism was continued daily for eighteen days, at the end of which time she was free from pain, from the spasms, and from the vomiting. Her appearance was immensely improved, and she had increased seven pounds in weight. The galvanism was now discontinued, but the strychnia mixture and the brandy were persevered with for over a month longer. She was then well.

CASE V. *Irritation of the Lumbar Region of the Spinal Cord.*—E. T., an unmarried lady, aged twenty-nine, consulted me, August, 1869, for paralysis of the lower extremities, attended with spinal tenderness and abdominal pains. She had been treated for inflammation of the spinal cord, had been cupped, leeches, and had had an issue made over the seat of the pain.

When I first saw her she was unable to walk, having been in this condition for several months. As she sat in her chair, she could readily move her legs in any desired direction, but to bear her weight upon them was an utter impossibility. There was no alteration of sensibility. Her general appearance was not anæmic, nor was she in the least degree hysterical. Upon careful examination, I was unable to find any reason to induce the belief that she was laboring under spinal congestion, meningitis, or myelitis, or that there was softening of, or pressure upon, the cord. I, however, discovered great tenderness over the first and second lumbar vertebræ, and found that strong pressure in this region induced deep-seated spinal pain and sharp neuralgic sensations along the course of the crural nerves.

Regarding the case as one of pure spinal irritation, I applied the constant galvanic current to the back every alternate day, and administered the following prescription: *R. Zinci phosphidi, grs. iij, ext. nucis vom. grs. xv. M. ft. in pil. no. xxx.* Dose, one three times a day. I likewise directed the application, to the painful part of the spine, of flannel, wrung out of spirits of turpentine to be continued daily till redness and decided smarting were produced. A full and nutritious diet with ale was enjoined. Under this treatment she improved so rapidly in every respect that in twenty-three days she was able to walk with a cane,

and in a few days more than a month was well, being in as good health, according to her own report, as she had ever enjoyed in her life.

I have full notes of a number of other interesting cases, but this paper has already been extended to so great a length, that I must defer their relation to some other time. Meanwhile, I am not without the hope that I may have succeeded in presenting some interesting details to the members of the Society.

Maudsley on the Mind.

The Physiology and Pathology of the Mind. By HENRY MAUDSLEY, M. D., Physician to the West London Hospital. 8vo, pp. xv-442 (tinted paper). . . . Cloth, \$4.00

Dr. Maudsley's aim in the preparation of this volume has been to treat of mental phenomena from a physiological rather than, as has hitherto been the habit, from a metaphysical point of view, and in his history of the inductive method, as applied to the interrogation of the mind, he shows conclusively that self-consciousness—the favorite resort of the schoolmen—is inadequate, contradictory, and unreliable. No book of the present day, devoted to the study of the mind, has attracted more attention or caused more comment than this. It is one of those works which mark the beginning of a new era in the study of mental science, and at the same time it is conceded on all sides to be, in its practical portions, a most reliable guide for the diagnosis, description, and treatment of insanity.

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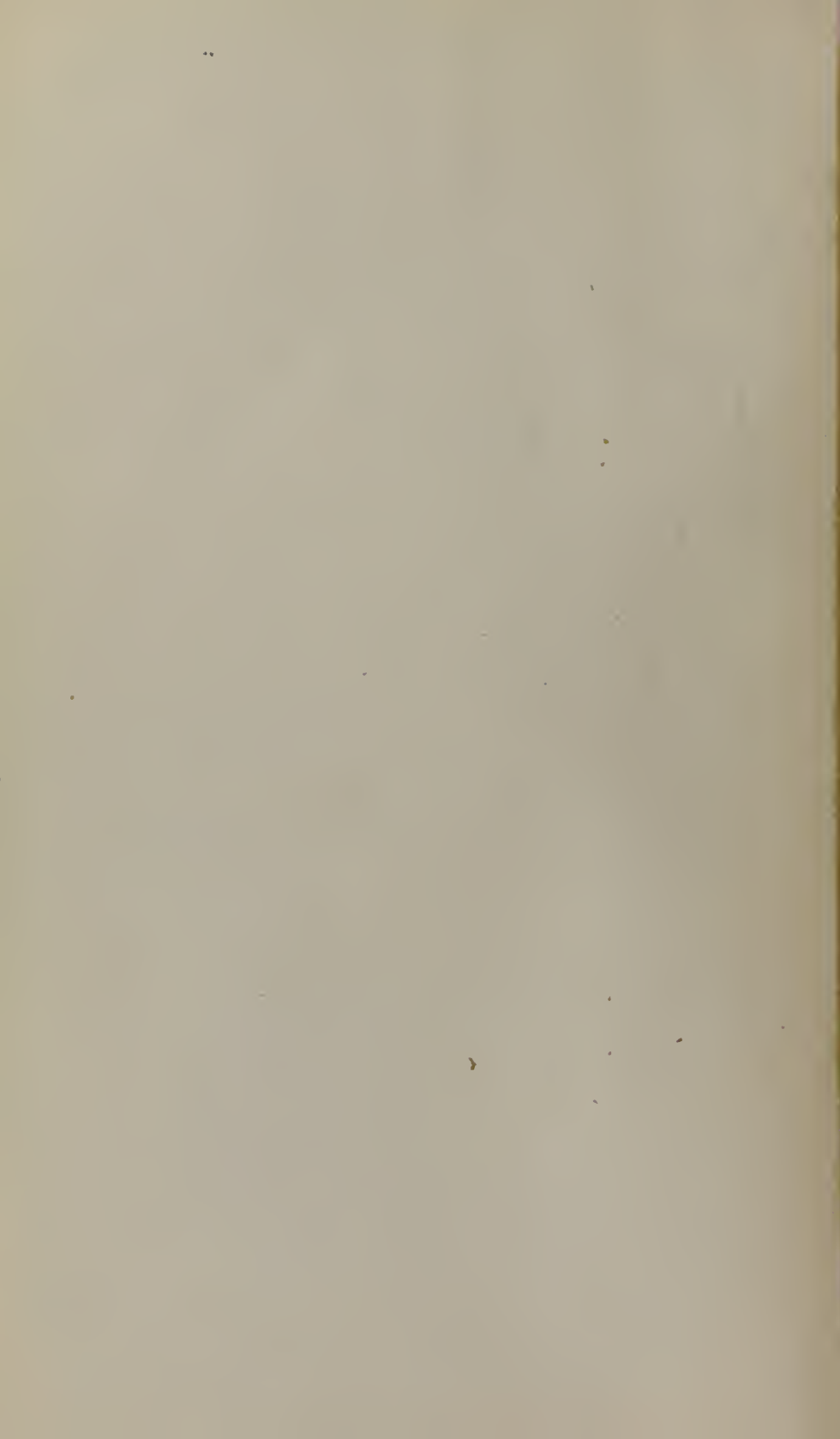
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